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DESCRIPTIONS OF SIX NEW FORMS[1] OF FLORIDA TREE SNAILS, *LIGUUS FASCIATUS*

Archie L. Jones
1370 S.W. 14th Street
Miami, Florida 33134

In the spring of 1962 I found a group of snail hammocks in the southern Everglades of Florida that had never before been explored by *Liguus* collectors. One of these supports a polymorphic colony of *Liguus fasciatus* (Müller) that includes two new color forms.

In Pilsbry's (1946) classification of *Liguus fasciatus*, these new forms would be placed in the subspecies *testudineus* Pilsbry. Their closest relationship is with the form *castaneus*. I have called these two forms, or morphs, *humesi* and *framptoni*.

Four years earlier (1958) I had set out with a friend in his airboat in search of an especially beautiful form, *marmoratus*, which a Seminole Indian, Smallpox Tommy, had shown me. We picked up Tommy at his camp three miles north of the Tamiami Trail. A lack of communication between the Indian and us, or his reluctance to take us there, prevented us from finding our *marmoratus*. The group of hammocks to which he took us contained instead a new form of the subspecies *testudineus*, namely *evergladesensis*.

The deplorable practice by collectors of transplanting the Florida tree snail, *Liguus fasciatus*, to hammocks already populated with other *Liguus* began before the turn of the last century and continues to this day. Collectors gathered choice specimens of this magnificent snail and put them in selected hammocks with the expectations of collecting them and their progeny before some other collector did. In 1947 I interviewed a Mr. Lincoln, a former Florida West Coast shell dealer. He was then in his late eighties and resided in a rest home in Ft. Myers, Florida. He told me that when he was a young man he transplanted some *Liguus* from Long Pine Key of the Lower Everglades to Big Pine Key in the Lower Florida Keys. Charles Torrey Simpson introduced them into his hammock in Lemon City (North Miami) so that he could more easily observe and study them. "In my bit of forest, into which I have carried many specimens from elsewhere - - -."

A great flurry of transplantation occurred immediately before the establishment of the

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[1] Latinized names for color forms, *forma*, varieties, or aberrations are useful to students of variation, but these infrasubspecific names, proposed after 1960, have no nomenclatural standing, and hence no priority over properly proposed specific or subspecific names, according to Articles 1 and 10b of the International Code Zool. Nomen. - Editor.

Everglades National Park in 1947. Collectors rushed to the then-to-be Park and removed some of the more beautiful varieties and relocated them outside the Park in Pinecrest, Collier County, the East Coast Ridge and the Florida Keys. They hid them almost anywhere they thought the snails would not be found by other collectors. This distribution in no way hurt the Park colonies but the cumulative effect of all the introductions greatly affected the gene mix of once reasonably stable populations, so that now it would be next to impossible to work out the mystery of the distribution of these snails in southern Florida.

Liguus feed upon the minute lichens, fungi, sooty molds and algae that grow on the bark and leaves of trees, shrubs, etc. They use their radulae to scrape these foods and loose particles of bark from the hammock vegetation. Newly hatched snails begin feeding at the bases of trees and, during periods of wet weather, work their way to the tops of the trees, feeding as they go.

In the descriptions of the forms that follow, I have used the words large, medium size and subsolid in describing the size and solidity of shells. One should understand that the size and solidity of *Liguus* shells are determined to a lesser degree by heredity and to a greater degree by the amount and quality of the snail food found in a hammock. It follows, therefore, that when one describes the size and thickness of a *Liguus* shell, one describes to a greater degree the condition of the hammock as it relates to *Liguus* and to a lesser degree the inherant nature of the shell itself. For example: if one took, say, 45 newly hatched *graphicus* from one small colony, divided them equally into three lots and put one lot in a hammock with a maximum amount of food on the lysiloma and Jamaica dogwood trees; the second group in an identical hammock with a minimum of food; the third lot in a hammock forested principally with bustic and hackberry with optimum food, one would get three very different results. If one were to describe the size and solidity of each group at the end of the third year of activity, the descriptions would be approximately as follows:

First group - large size (up to 70 mm.), solid;
Second group - small size (up to 46 mm.), thin;
Third group - large size (up to 65 mm.), thin.

These facts were not understood by some describers of *Liguus* and it has caused confusion and difficulty in subsequent identifications of some forms of snails.

Liguus fasciatus humesi, *new form*

Figs. 5, 6

Description: Shell medium size (up to 55 mm. in length), moderately elongate, subsolid; texture lustrous in young shells to dull in old specimens; whorls not inflated, slightly convex; columella sinuate to straight, thin; palatal lip smooth, occasionally crenate at juncture of periostracal green lines, slightly thickened within.

Color: apex pink; columella and parietal wall invariably white except in thin shells where the color of the shell penetrates the very thin white callus which produces a slight pinkish effect; there is a narrow white to creamy brown sutural line; the third whorl is light-pink to brown and is marked with a few brown axial striae; the color of the fourth, fifth, sixth and last whorls is dark-brown to almost black, broken by irregular yellowish axial stripes (which are often zigzag) and blotches that often extend from suture to suture on the fourth, fifth and sixth whorls and from suture to the base of the shell on the last whorl; there is a narrow yellowish peripheral band that produces a dark band, broken by yellow axial flames and/or blotches, above and below the periphery. A small percentage of shells have a few spiral green lines above and/or below the periphery.

Type material: The form *humesi* is found only in an isolated group of hammocks of the southern Everglades. The holotype and paratypes were collected March, 1962. The holotype has been placed in the United States National Museum, Washington, D.C. It is a four-year-old shell; length 46 mm., width 23 mm., aperture width 23 mm., distance from suture to base of shell 21.5 mm. Paratypes have been placed in the United States National Museum, Washington, D.C., the Museum of Comparative Zoology, Harvard University, the Academy of Natural Sciences of Philadelphia, University of Florida, Gainesville, and the Everglades National Park Collection, Homestead, Florida.

A lot of 129 shells, collected without selection included the following forms:

castaneozonatus	101	78%
cingulatus	11	9%
humesi	9	7%
framptoni	5	4%
luteus	3	2%
	129	100%

The color form *humesi* differs from the form *castaneus* by always having a white columella and parietal wall and by the absence of the single or double peripheral bands.

In 1964 a group of *humesi* was introduced into a hammock containing no *Liguus*. Since then I have visited this hammock scores of times during the last 15 years and have not seen any of the other forms associated with it in its native habitat.

It is with great pleasure that I name this shell for one who has played a significant part in the history of *Liguus* in Florida, Mr. Ralph Humes, now of Leesburg, Florida, intimate friend, delightful snailing companion and dedicated conservationist. He donated his fine large *Liguus* collection to the Everglades National Park. He is the originator of the Park *Liguus* project on which he collaborated until he moved from Miami. Mr. Humes described the color form *wintei* and wrote a history of *Liguus* collecting in Florida.

Liguus fasciatus framptoni, *new form*

Figs. 7, 8

Description: Shell medium size, (up to 55 mm. in length), moderately elongate, subsolid; texture lustrous in young to dull in old shells; whorls not inflated, slightly convex above the periphery; columella sinuate to straight, thin; palatal lip smooth, occasionally crenate at juncture of periostracal green lines, slightly thickened within.

Color: apex pink with a minute brown spot on its summit; columella and parietal wall invariably pink or liver-colored; there is a narrow creamy brown sutural line; the third whorl is creamy brown, sometimes with faint narrow light brown axial streaks; the color of the fourth, fifth, sixth and seventh whorls is dark-brown, broken by irregular yellowish axial striae (which are often zigzag) and blotches that often extend from suture to suture on the fourth, fifth and sixth whorls and from the suture to the base of the shell on the last whorl; there is a narrow yellowish peripheral band that produces a dark band, (sometimes wanting on the last whorl) broken by yellow axial flames and/or blotches, above and below the periphery. A small percentage of shells have a few faint spiral green lines above and/or below the periphery. A brown or purplish sinuating line borders the parietal wall from termination of the suture to the tip of the columella. It is a parallel form to *humesi*, differing only in the light-brown coloration, the pink or liver-colored columella and parietal wall and the pink apex with the minute brown spot at the summit.

Type material: This color form is found with *humesi, castaneozonatus, cingulatus* and *luteus* in an isolated group of hammocks of the southern Everglades referred to above in the description of *humesi*. The holotype, a three-year-old shell, has been placed in the United States National Museum, Washington, D.C. Its length is 47 mm., width 23 mm., aperture width 12 mm., distance from suture to base of shell 21 mm. Paratypes have been placed in the United States National Museum, Washington, D.C., the Museum of Comparative Zoology, Harvard University, the Academy of Natural Sciences of Philadelphia, University of Florida, Gainesville, and the Everglades National Park Collection, Homestead, Florida.

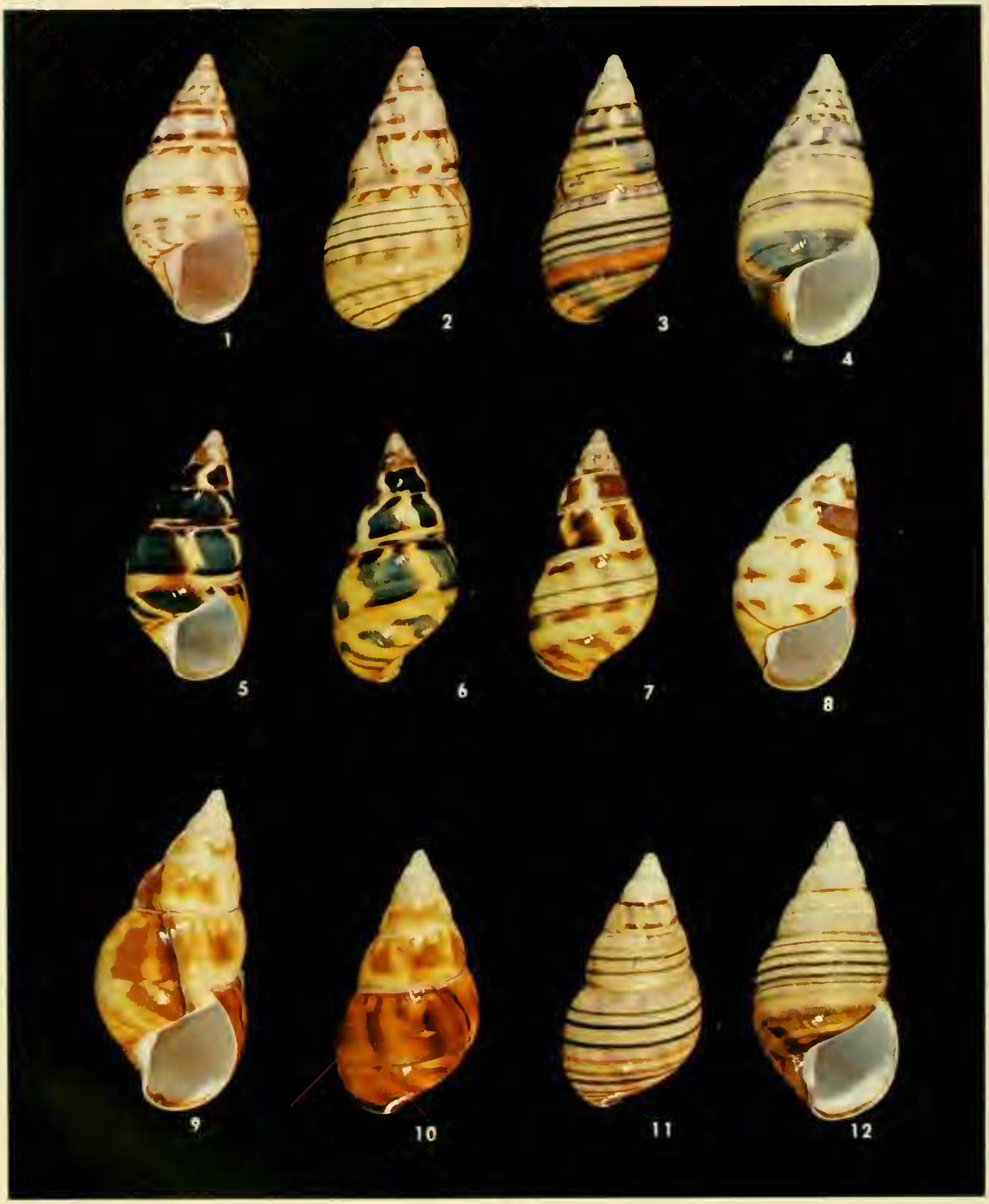
The offspring of a number of *framptoni* introduced several years ago into a hammock devoid of *Liguus* were predominately *framptoni*, some *humesi, luteus* and very rarely *castaneozonatus*.

I have named this form in honor of Henry G. Frampton (1902 - 1966), one of the early modern collectors of Florida *Liguus*, who contributed to the literature by describing the forms *splendidus, fuscoflammellus* and *clenchi*. His widow, Theodosia, presented his fine, large *Liguus* collection to the Museum of Comparative Zoology, Harvard University.

Liguus fasciatus evergladesensis, *new form*

Figs. 1, 2

Description: Shell medium size, moderately inflated, subsolid, texture matt or without much gloss; whorls convex, last whorl well rounded;



FIGS. 1-12. *New color forms of* Liguus fasciatus *(Müller) from the Florida Everglades. Apertural views are holotypes, dorsal views are paratypes.* **1, 2,** evergladesensis. **3, 4,** margaretae. **5, 6,** humesi. **7, 8,** framptoni. **9, 10,** kennethi. **11, 12,** beardi. *All* formae novae *Jones, 1979.*

sutures not very deep, well shouldered; columella usually thin, straight and simple, occasionally slightly sinuated; palatal lip smooth, slightly crenate at juncture of periostracal green lines, slightly thickened within.

Color: apex, columella and parietal wall invariably pink. Ground color is light-yellow. The antepenult whorl is marked by a broad smoky lavender band broken by yellow vertical flames or blotches. Above and below this band are narrow rufescent bands. On the penultimate and body whorls the broad band degenerates into alternating vertical smoky lavender and light-yellow flames. The two narrow bands become a series of comma-like blotches. The yellow ground color predominates. On the body whorl, the vertical flames are broken at the periphery by a very light-yellow band and/or a lavender line. The columella is bordered by a narrow pink line. There is a narrow reddish brown basal line which is often reduced to a series of blotches. Almost all shells have from one to five spiral green lines above the periphery and from one to four below.

Type material: The type locality is one of a group of four or five hammocks about one mile west of Canal Levee 28 about six miles north of the 40-Mile Bend of the Tamiami Trail. The holotype has been placed in the United States National Museum, Washington, D.C. It is a three-year-old shell: length 48 mm., width 25 mm., aperture width 14 mm., distance from suture to base of shell 23 mm. Paratypes have been placed in the United States National Museum, Museum of Comparative Zoology, Harvard University, the Academy of Natural Sciences of Philadelphia, University of Florida at Gainesville and the Everglades National Park Collection, Homestead, Florida.

Comments: Form *evergladesensis*, in its first year superficially resembles *castaneus* but in later growth the juxtasutural bands are absent or reduced to a series of blotches. The columella and parietal wall are invariably pink whereas in most *castaneus* they are white. It is unique among Pinecrest and Collier County subspecies *testudineus*, being the only form having a full pink tip. I doubt if there is any close genetic relationship between *evergladesensis* and *castaneus*. Over 50 miles separate the two forms. The closest hammocks containing *castaneus* are those of the Long Pine Key area near Homestead. The form *evergladesensis* is found with *livingstoni*, the predominant form, and with the form *floridanus*. It is interesting that while they are found in a polymorphic population they breed true to form when isolated. Such populations introduced in two southern Everglades hammocks in 1961 have never produced any other forms.

Liguus fasciatus margaretae, *new form*

Figs. 3, 4

Description: Shell large (to 64 mm. in length), elongate; texture subsolid with a sheen but appears dull; body whorl convex, well-shouldered; penultimate whorl convex; the antepenult, fourth and third whorls flat; columella straight, not thin, slightly twisted, occasionally obliquely truncated; palatal lip slightly thickened within, usually crenate at juncture of periostracal green lines which are numerous and always present.

Color: columella and first two or three whorls of spire are white. There is a narrow suprasutural creamy yellow band and a subsutural mahogany-colored line. The fourth whorl is ivory-white broken by reddish brown subsutural spots that often develop into vertical striae that extend downward almost to the suture. The fifth, or antepenult whorl, has a broad bluish gray band broken by light-tan vertical flares that increasingly diffuse on the penultimate and body whorls and on the body whorl are overlaid with a blue-green wash above the reddish mahogany peripheral line and a wide darker green wash below the light-tan narrow band that lies immediately below the peripheral line. There is often a baby-blue line immediately above the peripheral line. An orange basal band borders the columella and it is bordered by a much darker band that extends from the base of the shell to approximately two-thirds the distance to the suture.

Type material: The type locality is a small hammock of the southern Everglades. The holotype is a mature, three-year-old shell, length 54.5 mm., width 26 mm., aperture width 13 mm., distance from suture to base of shell 22.5 mm. It has been place in the United States National Museum, Washington, D.C. Paratypes were also placed there and in the collections of the Everglades National Park, Homestead, Florida.

Museum of Comparative Zoology, Harvard University, Academy of Natural Sciences of Philadelphia and the University of Florida at Gainesville.

Comments: This race of snails descended from five snails that appeared in a hammock in which I had placed together *lucidovarius* from Pinecrest Hammock No. 11 and *clenchi* from Pinecrest Hammock No. 88. One of these shells had a so-called "jewel tip", or apex of pinkish brown. This population produced the two above-mentioned forms, *lossmanicus*, many intermediates and the five ancestors of *margaretae.*

The five snails were transferred to another hammock which had no snails. Two years later I returned and saw about 15 newly hatched snails (all of the white-tipped form), three white-tipped parents and the dead jewel-tipped shell. If this jewel-tipped snail died before it mated it could account for the white-tipped offspring.

One would expect to find the polymorphism of the first hammock to show itself in the snail population of the second hammock but this has not occurred. Since the introduction in July, 1969 all offspring have been *margaretae.*

The distinguishing characteristics of *margaretae* are the light blue-green wash over the body whorl and the spire pattern of *lucidovarius.* In recently collected shells the wash appears to be more blue than green but as the colors fade green predominates.

I name this shell for my wife whose patience and understanding made it possible for me to spend many thousands of hours in the field these 45 years since I first began snailing in 1934.

Liguus fasciatus beardi, *new form*

Figs. 11, 12

Description: Shell similar to that of *margaretae*, except for color and pattern. First whorl of spire pink, faintly tinged with brown at the summit. Next two or three whorls ivory-white or white, sometimes flecked with ochre. There are supra and subsutural light-brown lines which are darker, heavier and broken on the antepenult whorl. On the penultimate whorl this line sometimes appears as brownish spots. The overall *color* of the shell is grayish brown wash, broken at the periphery by a wide, lighter colored band which is dissected by a heavy, brown or mahogany line. There are usually four or five green lines above and about three or four brownish green ones below the periphery. The columella is white or nearly so. The parietal wall is light-purple. There is a brownish purple line bordering the parietal wall which extends from the suture to the tip of the columella. Bordering this line at the base of the shell is a lighter colored band sometimes bordered by a darker one.

Type material: The type locality is a small hammock of the southern Everglades near the type locality of *margaretae.* The holotype is an adult three-year-old shell: length 54 mm., width 26 mm., aperture width 14 mm., distance from suture to base of shell 24 mm. The holotype has been placed in the United States National Museum, Washington, D.C. Paratypes have been placed in the United States National Museum, the Everglades National Park Collection, Homestead, Florida, Museum of Comparative Zoology, Harvard University, Academy of Natural Sciences of Philadelphia and the University of Florida, Gainesville.

Comments: There is almost a total lack of vertical markings of any sort, except as described above. Occasionally a shell will have a trace of the blue-green wash of *margaretae* on the body whorl.

It gives me much pleasure to name this shell for Dan Beard, first superintendent of the Everglades National Park, whose foresight and encouragement made possible the introduction of rare and beautiful forms of *Liguus* into the Park where, hopefully, they will be saved for future generations of scientists to study and for Park visitors to observe and enjoy.

Liguus fasciatus kennethi, *new form*

Figs. 9, 10

Description: Shell large (to 62 mm.), moderately elongate, subsolid to solid, somewhat lustrous to dull; whorls 7 - 7½, convex; columella heavy, straight but slightly twisted, obliquely truncated.

Color: first three whorls of the apex and columella ivory-white, parietal wall very light-flesh color. The ground color of the body whorl is yellow with an overlay of blotches, smears and vertical stripes of burnt umber and umber which fade with time to yellow-ochre. There is a very narrow yellowish cream subsutural line and a narrow (1 - 2 mm.) peripheral band of the same color, sometimes bordered above by a lavender line. As the colors fade, each year's markings become lighter so that in some old shells the whorls above the body whorl are almost white. A few specimens show on the body whorls some spiral bandings as in the form *floridanus*. Periostracal green lines seldom present and few in number. Growth-rest varices slightly expanded.

Type material: The type locality is a small hammock of the southern Everglades. The holotype is a four-year-old shell, length 59 mm., width 28 mm., aperture width 15.5 mm., distance from suture to base of shell 26 mm. The holotype has been placed in the collection of the United States National Museum, Washington, D.C. Paratypes have been placed in the United States National Museum, the Museum of Comparative Zoology, Harvard University, the Academy of Natural Sciences of Philadelphia, University of Florida, Gainesville, and the Everglades National Park Collection, Homestead, Florida.

Comments: The progenitors of *kennethi* first appeared in Pinecrest Hammock No. 13 into which Mr. Erwin C. Winte had comingled some introduced *Liguus* with the native population. Unfortunately, no records were kept and information as to the identity of the forms introduced is uncertain. Mr. Winte and I isolated five snails of this new form in a barren hammock. Later most of the progeny were transferred to another hammock. Since then, the two colonies have remained monomorphic. This phenomenon, plus the fact that *kennethi* shows no similarity to any of the forms of the original population leaves its geneology uncertain. Its overall shape and appearance indicate only mainland forms were involved but its somewhat glossy appearance in five and six-year-old specimens suggests the influence of a Florida Keys ancestor.

I name this snail for my son whose help in the exploration for suitable hammocks, collecting *Liguus* material and establishing it in the Everglades National Park contributed substantially to the success of the Park *Liguus* Project.

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CHICOREUS COSMANI, A NEW MURICID GASTROPOD FROM THE WEST INDIES

R. Tucker Abbott
American Malacologists, Inc.
Melbourne, Florida 32901

and

C. John Finlay
116 Tanglewood Lane
Newark, Delaware 19711

Despite the fact that the taxonomy of the family Muricidae has recently suffered under the hands of various conflicting interpretations (E. H. Vokes, 1971, Radwin and D'Attilio, 1976; Wagner and Abbott, 1978), new, apparently valid, taxa continue to come to light (Emerson and D'Attilio, 1979). Contributing to our knowledge of marine mollusks is a corps of enthusiastic SCUBA divers and ardent private shell collectors. An outstanding example are the collecting efforts of Mr. Dieter Cosman of Long Island, New York, who has personally collected and documented numerous outstanding conchological discoveries in the tropical Western Hemisphere.

Among Mr. Cosman's unusual discoveries is a colony of *Chicoreus* muricid snails from Jamaica representing a species which evidently has not been given a valid, scientific name. We take great pleasure in naming this new species after him.

Chicoreus cosmani *new species*

(Figs. 1-9)

Description: Shell moderate in size for the genus, attaining a length of 79 mm., trigonally